



60 second interview | *David Garman*

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Dr. David Garman. Having left University following a PhD, Dr Garman took up a position with New South Wales Environmental Protection Agency. He worked there for two years, mainly focusing on pollution control issues and quality assessments of fresh and saline waterways around Sydney.

Shortly thereafter, he was recruited to a newly established Water Resources Commission with broad-ranging responsibilities over water resource management within New South Wales. Dr Garman spent thirteen years with the Commission, in roles ranging from a water quality officer through to Acting Director of Water Policy. He was able to see the organization from many different angles – from management of reservoirs, irrigation and drainage practice, through to interstate water policy, water pricing, institutional arrangements, water audits, and in the end a restructuring of the water industry in the State.

Following a major change in government, he left the Commission to join private industry at Elders Resources. This later merged with Kaiser Engineers, where he was responsible for corporate development and innovations, particularly in the environmental field. Following this spell in industry, Dr Garman was head hunted to join the Cooperative Research Centre (CRC) for Waste Management and Pollution Control and took the organization through a critical review and contract re-bid. More recently, he was persuaded to lead a new bid into the area of environmental biotechnology, which is his current position. He also has two directorships on listed companies, a number of other roles on research organizations and shortly, a listed company in the UK.

Dr Garman joined IWA in 1976 – originally being co-opted as a member of the Sydney Congress organizing committee; he ended up being part of the committee and presenting papers at the event. The greatest value that he has derived from the Association has been the presence of the network and friendship that this derives. The networks, more than anything, provide insights into new science, new engineering, changes in organizations, the 'movers and shakers' and world trends. In 2005, he was confirmed as incoming President for the Association, and his term of office will run from September 2006.

- *What do you consider to be the most significant recent change in your field of expertise to have occurred in the last 10 years?*

What I have observed since I started working in water, whether it is pollution control or water resources management, is a shift from purely publicly owned, government controlled organizations to a situation where there are many different institutional structures and means of service delivery. Perhaps that phrase, delivery of *services*, epitomizes the key type of change that has occurred.

One critical change is in the efficiency of delivery, and the efficiency of use. Those two paradigms have really transformed the way we think about water. Water was a free public good when I started in the sector. If people felt that they had to pay for water, then there was a major public backlash. Now the situation is the other way around, where people are demanding better and better quality and bringing about change. In Sydney, for example, we have the public leading the local water supplier by reusing water on their own volition.

A noticeable institutional change is the skill mix in organizations. There are changes in the types of people who are running organizations, moving away from accountants and civil engineers and towards financiers, experts in communication, people who are other types of engineers or scientists. This spread of skills has led to completely different insights into the way that organizations operate. The water industry has been one of the last to adopt some of these skills and approaches but there is now much greater pressure because there is a worldwide shortage of water – we are becoming managers of critical resources.

The science which has gone with these developments has undergone a significant transformation, especially in the introduction of biotechnology in the management of water contamination and processing of wastes. Developments are happening today which even five years ago would never have been considered, such as making bio fuels and plastics from waste, the rapid detection of pathogens using advanced biotechnology techniques, or translating microbial processes into advanced control systems used in wastewater.

- *What do you consider to be the most significant future challenge that professionals must deal with in the next 10 years?*

If I was to look at a long term, extreme view, then I believe that water is going to become like money supply. Water supply authorities are going to become water banks, whether for irrigation, urban water supply, supply of water to ecosystems, or in maintaining downstream flows for other purposes. I believe we could see a 'World Bank of Water'. As with any banking system, parts of the assets are fixed such as lakes, glaciers and reservoirs. Other parts are transient such as in a cash economy, being reused and circulated.

The debate around virtual water will become increasingly important. One of the most misleading advertisements I have seen is, 'save water, drink beer'. Of course, it is misleading because we know it takes six litres of water to produce one litre of beer. The type of pressures that industry will be under in the next ten years to reduce water, or reuse water is going to be critical to operating in a sustainable way. The concept of sustainability, through life cycle assessment, is going to have a higher and higher profile as it will impact on greenhouse gas and energy. We have to think beyond water cycles and in terms of total life cycles.

How to advocate for change? If the water industry does not engage in new ways of communicating its core business, it is going to be taken over by people who do, and at the moment those people are not part of the traditional water industry. The only alternative is for us to be ahead of the game – it means taking the lead in discussing alternative ways of management, of investments, in ways of looking at water and the future so that we approach those new industries which are coming into the water sector. We need to have a much stronger interaction with the finance industry, we need a greater interaction with water utilities – which will become like local oil companies, dealing with a scarce resource.

Lastly, water managers in any country will have an increasingly complex task. They will need to balance the amount of water for crop production, to consider biotechnology crop needs, to targeting irrigation to areas where it is much more efficient; to balancing competition in water use. Solutions to this type of dilemma will only come when we start paying the proper price for water, and at worse this might be a resource tax in some way for the use and access of water. The nearest we come to this is the water trading issue which we have in the Murray-Darling basin in Australia. This type of water trading is beginning to change the whole valuation of water – at the beginning of a season water may trade for A\$200 per megalitre, at the end of the season it may be A\$8000, and I believe someone paid A\$20,000 per megalitre to finish a crop at one stage.

- *Whom do you consider to be the leading expert in your field, outside of your own organization, and why?*

One of the people who has really impressed me is Prof. Peter Wilderer, both for his breadth of views, and his insights into subjects as detailed as bio film applications through to understanding the critical elements of sustainability. Others include Peter van Roelem, who is leading Europe in the field of environmental biotechnology, and relative newcomers such as Prof. Mark van Loosdrecht who is pushing the technical

envelope and is prepared to challenge existing conventions. Our own Linda Blackwall is notable in terms of environmental biotechnology, cellular physiology and mixed microbial ecology; and a previous IWA President – Piet Odendaal – on his recognition of IWRM. Those are the sorts of people that come to mind. I think the single thing that they have in common is their ability to disregard conventional thinking and reinterpret so-called facts. It is that ability to change and challenge conventional wisdom that has led to these insights and advances; they have led and people have followed them.

- *In what ways would you like to see IWA change in the next 5 years?*

What I would like to see is that the Association will become *the* network that everybody wants to belong to; that people see that you *must* be part of it if you are involved in water management worldwide. It does not matter if you are a scientist, manager, operator, equipment supplier – they realise that being part of the IWA ‘family’ is part of looking towards the future, doing business and being affiliated to a professional body for which they will get recognition.

- *What are the key fracture points – issues of conflict or debate in your specialist area?*

I have always been against the notion that appropriate technology equalled low technology, but it is a hard message to get across. One of my personal insights that led to this conclusion was the ‘SkyJuice’ low pressure membrane filtration systems for supply of water to either people in emergency need or developing countries. This uses high technology material in a very low technology application. Now we have towns in some developed parts of Australia which are asking for similar systems on a commercial scale because they need better water quality.

The second point is that people believe that low technology is cheaper than high tech and generally it is not – when you calculate the total cost, it can be both energy and labour intensive and it does not always fit the social and cultural needs of the groups to which it is targeted.

- *Forthcoming news of interest...*

Some work that is at the very early stages of development is in new ways of killing bacteria with bio films (for which a provisional patent has been lodged). The work is of interest because it delves into the understanding of the nature and fundamentals of organisms within bio films, which in turn leads to improved comprehension of bio fouling in pipes and distribution systems, sewers and catheters in the biomedical world.

Our understanding of mixed microbial systems actually leads back not only into water, but other aspects of human health. This type of breakthrough is the indication that we can provide much more impact on other sectors as a result of our fundamental research and applied research studies.

- *Core lessons...*

There have been a few significant and stressful changes in my career – once when I left University, and once when I left public service. If I had known then many of the things I know now then I could have shortened those periods of stress, and contributed more effectively to my organizations and to the sector. It is the transition from one business culture to another that has given me many different insights – such as why new technology fails to get to market and critical factors in overcoming those barriers.

- *Contact points*

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